Topics on Industrial Building Design and Design of Non-Building Structures
Quiz for Session 3: Industrial Buildings 2 – July 7, 2020
Due: August 4, 8:00 a.m. EDT – Submit through the online form

1. A good rule of thumb for the maximum aspect ratio for perimeter braced frame buildings is:
    a. 5:1
    b. 2:1
    c. 3:1
    d. 4:1

2. True or False: The maximum impact factor for a ramped, stepped pulse load is equal to 1.5.
    a. True
    b. False

3. When designing for stability, the design engineer must consider:
    a. Geometric imperfections and stiffness reduction due to inelasticity
    b. Connection deformations that contribute to displacements in the structure.
    c. Second Order Effects and Uncertainties in the system, member and connection strength and stiffness
    d. Items “a” and “c”
    e. Items “a”, “b” and “c”

4. The torsional buckling strength of an I-shaped column needs to be evaluated when:
    a. The member buckles about an enforced axis of rotation
    b. The effective length for torsional buckling is greater than the effective length for weak-axis flexural buckling
    c. The effective length for strong-axis flexural buckling is greater than the effective length for weak-axis flexural buckling

5. When lateral braces are offset horizontally from a column shear center…
    a. The offset can be neglected and the column can be designed only for flexural buckling between the braces
    b. Because any offset causes the braces to be ineffective, the offset braces must be neglected when designing the column
    c. The offset braces can be considered in the column design by calculating the constrained-axis buckling strength

6. Which pinned-end column has the greatest buckling strength?
    a. A column with 100% of the load at the top
    b. A column with 50% of the load at the top and 50% of the load at the mid-height
    c. A column with 100% of the load at the mid-height

7. WT horizontal braces…
    a. Are typically connected by bolting the flange to a gusset plate because this connection is efficient for both the fabricator and the erector
    b. Are typically connected by bolting the flange to a gusset plate because the gusset plate can be designed for the moment caused by the eccentric connection
    c. Are typically connected by bolting the stem (web) to a gusset plate because the connection is concentric

8. Eccentricities in common WT horizontal brace connections…
    a. Cause a reduction in the brace compression strength
    b. Can always be neglected when designing the brace
    c. Cause torsional buckling

9. For single-angle horizontal braces that are connected through one leg and designed according to the effective slenderness ratio method in AISC *Specification* Section E5(a)(1)…
    a. The connection eccentricity has been considered in the development of *Specification* Equations E5-1 and E5-2
    b. The brace is designed as a concentrically-loaded member
    c. Both a and b

10. For equal-length X-braces that are connected at the intersection, the tension diagonal provides out-of-plane lateral bracing to the compression diagonal when
    a. Both braces are in compression and the smallest compression load is equal to or greater than 65% of the largest compression load
    b. One brace is in tension and one is in compression and the tension load is equal to or greater than 65% of the compression load
    c. The thermal load is greater than 65% of the gravity load